



November 18, 2016

The City of Bexley, Ohio

Formal Request for Remediation Services Qualifications

Introduction

The City of Bexley was awarded a cleanup grant through the Ohio Development Service Agency (ODSA) for an abandoned leaking underground storage (UST) Site located at 396 North Cassady Avenue in Bexley, Ohio. A portion of the grant funding will be utilized to contract with an environmental firm to conduct remedial activities at the former gas station site, a residential property located at 380 North Cassady, and Ruhl Avenue in Bexley, Ohio. A Remedial Action Plan (RAP) was submitted and approved on September 8, 2016 by the State Fire Marshal's Bureau of Underground Storage Tank Regulations (BUSTR) as part of the grant application. A copy of the BUSTR approved RAP is provided as an attachment to this Request for Qualifications (RFQ).

The Property consists of one parcel (Parcel Number 101-05-003) totaling approximately 0.41 acres of land. The petroleum contamination from the Property has migrated across Ruhl Avenue and onto a residential property located at 380 North Cassady. The resident at 380 North Cassady reported petroleum vapors entering the home via the sump and an interim action involving the installation of a soil vapor mitigation system has been implemented. The remedial activities will address the sources that are on the Property, Ruhl Avenue, and 380 North Cassady.

Environmental firms providing remedial services that are interested in being considered should reply with a statement of qualifications (SOQ) no later than **4:00 p.m., December 9, 2016**. Statements received after this deadline will not be considered.

Responding firms will be evaluated and ranked in order of their qualifications. The City of Bexley will enter into contract negotiations with the most highly qualified firm.

Scope of Work

The RAP will consist of implementing two remedial techniques to accomplish the remedial goals; excavation of petroleum impacted soils (i.e. isolated excavation on the former gas station site to reduce contaminant contributions to the concentrations contributing residential property, and excavation on the residential property to reduce contaminant impacts to indoor air quality), and enhanced aerobic bioremediation. The bioremediation portion of the remedial action will entail adding compacted clean soil layered with an Oxygen Release Compound (ORC) within



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the excavation areas. ORC will be placed with backfill lifts near the residence foundation and a french drain system to be installed as part of this project.

Remedial Activities to be Implemented

- Assist the City of Bexley with preparation of public notice for remedial activities.
- Develop a Site specific health & safety plan.
- Coordinate and notify underground utility services prior to remedial activities.
- Conduct delineation sampling and baseline ground water, sub-slab vapor, and sump water sampling.
- Finalize excavation footprints based on delineation sampling.
- Conduct quarterly sub-slab vapor monitoring beneath the residential structure after excavation activities are completed. Collect quarterly sump water samples and indoor air sampling.
- Coordinate with the City of Bexley for closure of Ruhl Avenue for excavation activities.
- Excavate and remove approximately 100 tons of petroleum contaminated soil from the Subject Property.
- Excavate and remove approximately 750 tons of petroleum contaminated soil from the residential property.
- Collect ground water encountered during the excavation and store on-site for ORC amendment mixing and injection.
- Install french drain piping and gravel within the excavation on the residential property.
- Backfill excavations with a mixture of clean soil, gravel, and granular ORC.
- Place ORC with backfill lifts near the residence foundation and the french drain system.
- Install a permeable reactive barrier (PRB) infrastructure in the Ruhl right-of-way north of the residential property for potential future injections of ORC.
- Restore the Site to preconstruction conditions after field activities have been completed.
- Assist the City of Bexley with preparation of notification of underground injection to Ohio EPA (if required based on sampling results).
- Provide laboratory sampling results to City of Bexley's environmental consultant.
- Conduct post-treatment ground water sampling 6 months and 1-year following completion of excavation backfill and soil amendment tasks. To include collection of field parameters from four (4) selected monitoring wells and ground water level measurements from all network monitoring wells.
- Collect a baseline sub-slab vapor sample from the residential vapor mitigation system prior to excavation and soil amendment activities. Following field construction activities, sub-slab vapor samples will be collected on a quarterly basis for a period of one year.



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Required Information

Your firm's Remediation Services Statement of Qualifications should include the following information in the order outlined below:

1. Firm's history as it relates to this type of project. Individuals or Firms must have personnel on staff who have documented prior work experience with remedial design and implementation for petroleum impacted media and the State of Ohio's Fire Marshal, Bureau of Underground Storage Tank Regulation (BUSTR) Corrective Action Requirements (Ohio Revised Code 1301:7-9-13 and the rules promulgated thereunder). The firm may not subcontract or partner with other firms for personnel to satisfy the minimum qualifications and experience;
2. Firm's capacity to handle the remedial services for the project;
3. A description of the firm's approach to implement the remedial services. Briefly describe the provisions and procedures that the firm would recommend including the firm's practices and procedures to best protect the City of Bexley and key stakeholders with respect to project controls and cost savings approaches;
4. References of three (3) similar projects, including contact names, a description of the project, timeline to complete the project, and the project costs;
5. The names of all team members, including subcontractors, that would be assigned to the project and the role they would play, including a brief description of certifications, skills, and abilities of each;
6. A description of the firm's project management philosophy, including progress meetings and presentations to the City of Bexley and key stakeholders;
7. A description of any information or documentation believed to be pertinent, but not specifically requested in this RFQ that may be useful and applicable to the project;
8. Provide documentation on the firm's OSHA Total Recordable Incident Rate (TRIR) for 2013, 2014, 2015 and three year average; and,
9. A disclosure of all information (including but not limited to the project, owner, reason, outcome) concerning any of the following within the last five years with respect to remedial or general contractor services:
 - a. Suits or arbitrations filed by or against you and your firm, judgments entered against you or your firm, and claims made by or against you and your firm, and
 - b. Any declarations of default or terminations for cause. Further, state whether you or your firm have been debarred or otherwise found ineligible to submit proposals or bids on or entering into any government contract.



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In addition, each qualifications package should comply with the following:

- Statements of Qualifications must be submitted to The City of Bexley at 2242 East Main Street, Bexley, Ohio 43209, Attention: Kathy Rose, Director of Building and Zoning, by no later than 4:00 P.M. Local Time, Tuesday, November 29, 2016.
- Each firm must submit a proposal clearly marked: "Remediation Services Qualifications for UST Remediation at North Cassady and Ruhl Avenue."
- The body of the SOQ should be limited to 20 pages plus attachments.
- One (1) original, completed and signed in blue ink, and two (2) copies are required, as well as one (1) electronic copy. Please size the proposal to 8 ½" X 11". Please use tabs to identify each section.
- Packages submitted by email or fax are not acceptable and will not be considered.
- The City will return unopened any proposals that are received after the deadline outlined below.

Evaluation Criteria

The qualifications for Environmental Firms and the basis for the evaluation of qualifications submitted will be:

- Experience of the firm and its employees with comparable projects, including size, nature and complexity.
- Competence to perform the required services as indicated by the qualifications of the team assigned to the project.
- Past performance as reflected in evaluations of previous clients and other professionals with whom the firm has worked, with respect to factors such as control of costs, quality of work, ability to meet deadlines, and ability to work cooperatively with the City of Bexley and other professionals involved with the Project.
- Understanding of the Scope of Work and evidence of financial responsibility.
- Safety measures implemented during project and the firm's OSHA Total Recordable Incident Rate (TRIR).

Evaluation Criteria	Points
Experience with Comparable Projects	10
Key Personnel Qualifications	30
Implementation Procedures on Similar Projects	20
Project Understanding	30
Safety	10



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Selection Process

The City's selection team will review all proposals and evaluate responses to the RFQ. The City of Bexley will rank the firms from highest to lowest score based on the evaluation criteria above. The City of Bexley will enter contract negotiations with the top ranked firm. Upon successful negotiations, the firm will enter into an agreement for services with the City of Bexley.

Schedule

November 18, 2016	RFQ Published
November 30, 2016	RFQ Questions (Before 2:00 PM Eastern Standard Time)
December 02, 2016	Answers to RFQ Questions (Posted on City of Bexley Website)
December 09, 2016	RFQ Due by 4:00 PM EST
December 13, 2016	Top Ranked Firm Notified and Initiate Contract Negotiations

Questions

Questions concerning any aspect of this RFQ must be submitted by electronic mail to Kathy Rose, Director of Building and Zoning at krose@bexley.org. RFQ questions will not be accepted after 2:00 pm eastern time on November 22, 2016.

The City is not, by virtue of issuing this RFQ, obligated to enter into a contract and reserves the right to not issue as a result of this solicitation.

Attachment

The approved Site Specific BUSTR RAP is attached.

End of RFQ



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ATTACHMENT

BUSTR RAP

**BUREAU OF UNDERGROUND
STORAGE TANK REGULATIONS
REMEDIAL ACTION PLAN**

**Former Sunoco
396 N. Cassady
Bexley, Ohio
Release No. 25002648-N00001
Hamilton, County**

June 21, 2016

Prepared For

City of Bexley

Prepared By



TRC Environmental Corporation
11231 Cornell Park Drive
Cincinnati, Ohio 45242

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1.0 INTRODUCTION

TRC Environmental Corporation (TRC) was retained by the City of Bexley to prepare an application for the Ohio Abandoned Gas Station Cleanup Program. As part of this request TRC prepared a Remedial Action Plan (RAP) for the State Fire Marshal's Bureau of Underground Storage Tank Regulations (BUSTR). Cassidy 396 LLC is the owner of the former Cassidy Sunoco Station located at 396 N. Cassidy Avenue in Bexley (Franklin County), Ohio (Property). The Property consists of one parcel (Parcel Number 101-05-003) totaling approximately 0.41 acres of land. The Property is currently bound to the north by Art with Anna, an art school, art studio, and art supply store with parking lot; to the south by Ruhl Avenue and a single-family residential housing; to the east by an Unnamed Alley and single-family residential housing; and to the west by North Cassidy Avenue and single-family residential housing.

The petroleum contamination from the Property has migrated across Ruhl Avenue and onto a residential property located at 380 North Cassidy. The resident at 380 North Cassidy reported petroleum vapors entering the home via the sump and an interim action involving the installation of a radon-like soil vapor mitigation system has been implemented. The site investigations and remedial activities will address the sources that are on the Property, Ruhl Avenue, and 380 North Cassidy.

The Property was first developed as a retail gasoline service station which performed automotive repairs in the late 1930s. No major changes occurred on the Property until the site was rebuilt as a gas station in 1970. During the site reconstruction, the two original buildings were demolished, the three 1,000 gallon USTs were abandoned in place, a new building was constructed on the northern half of the property and two 6,000 gallon gasoline USTs, one 8,000 gallon gasoline UST, and one 550 gallon used oil UST were installed on the property. The three 1,000 gallon USTs were removed in 1993.

In 1998, a petroleum release was identified at the site with contamination in soil and ground water. The first response to the identified release was to remove the four USTs which were installed in 1970. During the tank removal activities, petroleum impacted soil and ground water were encountered in the cavity and removed. In 1998, two new USTs a 10,000 and 12,000 gallon gasoline UST were installed at the site within the existing tank cavity. The Property continued to be used as a gasoline service station until 2009. The two newest USTs were removed from the property in 2009. The Property was then used as an automotive repair shop until 2014. Since 2014 the site has been vacant. The proposed end use for the Property is as a breakfast lunch casual neighborhood restaurant.

The previous environmental assessments and investigation reports are summarized below.

- ***UST Closure Report (Closure Report) by Judge Engineering, dated December 20, 1993*** – This Closure Report documents the removal of the three, 1,000-gallon former gasoline USTs (tank serial numbers A-331508, A-33517, and A-331518) that had apparently been capped and closed in place at some point in the past. The closed tanks were discovered in November 1993 during excavation activities to install footers for a canopy to cover the then existing gasoline pumps. Approximately 160 cubic yards of soils were excavated, staged onsite, and subsequently disposed during removal activities; approximately 1,300 gallons of petroleum-contaminated water were also removed and disposed. The report documents the presence of benzene in soils above BUSTR Action levels and states a need for additional investigation and cleanup.
- ***Environmental Site Assessment (ESA) by SEC, dated December 3, 1998*** – This ESA documents soil and ground water sampling activities performed at the Subject Property. The ESA documents the presence of BTEX in soil and ground water above applicable BUSTR Action Levels as well as the presence of free-phase NAPL encountered at three of seven test borings and at an observation well installed within the UST tank cavity.
- ***Cover Letter to the UST Closure Assessment Report (Cover Letter) by SEC, dated March 7, 2000*** – The Cover Letter references sampling performed at 380 N. Cassady and the removal of three gasoline USTs and one used oil UST at 396 N. Cassady; the gasoline USTs were replaced with fiberglass USTs. Approximately 720 cubic yards of petroleum-contaminated soil, 550 gallons of free-phase product (gasoline), and 8,300 gallons of petroleum-contaminated “perched” water were removed and disposed. The actual Closure Report was not included in the file(s) received from BUSTR.
- ***BUSTR Tier 1 Evaluation by SEC, dated April 19, 2000*** – This Tier 1 Evaluation documents the installation of seven “test borings” at locations surrounding the tank cavity for the former 8,000-gallon and 12,000-gallon gasoline USTs; six of these borings were converted to monitoring wells and sampled. The evaluation documented the presence of benzene in soils above BUSTR Action levels in five of the seven soil borings; benzene in ground water at MW-1 at concentrations above BUSTR Action levels, and 0.35 feet of free-phase product at MW-5. The Report also documents that ground water in the shallow, unconsolidated unit flows to the southeast; and notes the installation of a ventilation system installed over the sump pit of the residence located at the southeast corner of N. Cassady Avenue and Ruhl Avenue (380 N. Cassady Avenue) as an Interim response in late 1999.

- ***BUSTR Tier 2 Evaluation by SEC, dated September 11, 2000*** – This Tier 2 Evaluation summarizes and presents supporting data and figures related to site investigation activities conducted since 1998 (14+ soil borings and 11 monitoring wells; removal of two former gasoline USTs) and presents an evaluation of impacts to human health and the environment associated with the presence of petroleum contamination resulting from documented releases of petroleum from USTs at the Subject property. BTEX concentrations in soil and ground water above BUSTR Action Levels are documented. The Tier 2 Evaluation includes a determination that receptors at the downgradient residential property may be exposed to potentially unacceptable risk and recommends performing vacuum- assisted NAPL recovery at MW-5 as the prescribed remedy.
- ***Environmental Sampling and Analysis Report by SEC, dated July 30, 2007*** – This report summarizes soil and ground water sampling performed at 380 N. Cassady Avenue, located downgradient of the subject property. The sampling was performed in response to petroleum odors from a sump located in the basement of the of 380 N. Cassady Avenue residence. Two soil borings were installed at 380 N. Cassady Avenue; soil and ground water samples from temporary wells were collected. Both soil samples yielded benzene and total xylenes concentrations above applicable BUSTR Action levels; one ground water sample yielded benzene concentrations above BUSTR Action Levels.
- ***UST Closure Report by Easton Environmental Engineering, Inc. (Easton), dated July 15, 2009*** – Closure report for the 8,000 gallon gasoline and 12,000 gallon gasoline USTs. This report includes the documentation (closure report form, figures, permit(s), field inspection report, laboratory analytical reports, and disposal documentation) for closing and removing the two gasoline UST associated with the Former Cassady Sunoco Operations.
- ***BUSTR Tier 1 Evaluation by SEC, dated November 26, 2014*** – This report documents soil and ground sampling activities conducted at the site and the presence of BTEX present in soil and ground water above applicable BUSTR Action Levels, to include the presence of free-phase NAPL observed at MW-5. This Tier 1 Evaluation includes a copy of the Phase II ESA Report, dated June 30, 2014 by Tetra Tech, discussed above.
- ***Phase II ESA Report by Tetra Tech, dated June 30, 2014*** – This report documents the Phase II soil and ground water sampling activities (seven soil borings; monitoring well installation and sampling) conducted at the Subject property for the purpose of delineating the nature and extent of contamination associated with the documented petroleum releases and to support the findings of the Tier 1 Evaluation by SEC. The investigation documented the presence of VOCs throughout the subsurface and found that the highest BTEX concentrations were generally found in the lower sand seam at 10 – 12 feet-bgs., documented that petroleum COCs in ground water do not appear to be from off-property migration from the former gas station location to the north of the Subject

Property, and that offsite migration appears to be limited to the properties immediately downgradient of the Subject Property.

- **BUSTR Tier 2 Evaluation Report by SEC, dated July 16, 2015** – This report summarizes and presents supporting data and figures related to site investigation activities conducted since 1998 (34 soil borings and 15 monitoring wells); Free product documented in the former tank cavity and in soil borings and monitoring wells; petroleum odors reported from the sump in the basement of the house located to the south of the subject site across Ruhl Avenue (380 North Cassady Avenue; Tier 1 Investigation conclusion that the site qualifies for a non-drinking water scenario). The report also includes a pathway completeness evaluation for COCs associated with known petroleum releases from former USTs at the Subject Property and an Environmental Covenant restricting the Subject Property to non-residential use.

This RAP was prepared to implement remedial action to achieve conditions in the soil and ground water that will allow a No Further Action status to be granted for the Property by BUSTR.

This RAP includes the following:

- brief description of the remedial action alternatives considered;
- proposed target levels, identified by COCs, exposure pathway, and environmental media;
- description of the remedial activities to be implemented;
- conceptual design of the remedial action system;
- monitoring plan;
- progress report submittals;
- description of all permits or other governmental approval required for implementation of the RAP;
- descriptions of activities and studies, that may be required to be performed to implement the proposed RAP; and
- implementation schedule, projected completion date, and the submittal date for the conceptual completion report of the proposed RAP.

2.0 IDENTIFIED COCS AND PROPOSED TARGET LEVELS

As defined in the approved BUSTR Tier 2 Investigation dated July 16, 2015 for the subject and residential properties, xylenes on the residential property were found to exceed residential Site-Specific Target Levels (SSTLs). In addition, while Property concentrations of benzene and xylenes are below the commercial SSTLs, the site serves as a source area for continued contamination of the residential property. Therefore on-site soils above the residential SSTLs for benzene and xylenes will be excavated and removed.

Table 1: Summary of Exposure Pathways, Environmental Media, COCs, and Target Levels

COCs Above BUSTR Action Levels	Current Maximum Detected Levels (mg/Kg)	Target Levels (mg/Kg)	Environmental Media	Exposure Pathways
Benzene	37 (TB-5B)	76.3	Commercial Site Soil	Soil to Indoor Air
Toluene	119	17,300		
Xylenes	2,190	4,170		

COCs Above BUSTR Action Levels	Current Maximum Detected Levels (mg/Kg)	Target Levels (mg/Kg)	Environmental Media	Exposure Pathways
Benzene	3.2	4.66	Residential Site Soil	Soil to Indoor Air
Xylenes	212	84.2		

COCs Above BUSTR Action Levels	Current Maximum Detected Levels (mg/Kg)	Target Levels (mg/Kg)	Environmental Media	Exposure Pathways
Xylenes	212	1,670	Residential Site Soil	Soil Leaching to Non Drinking Water

COCs Above BUSTR Action Levels	Current Maximum Detected Levels (mg/Kg)	Target Levels (mg/Kg)	Environmental Media	Exposure Pathways
Benzene	ND	100	Commercial Site Soil	Direct Contact

Target indoor air screening levels (C_{ia}) are established based on current USEPA Regional Screening Levels (RSLs)¹ for indoor air assuming a target cancer risk of 1E-05 and noncancer hazard of 1.0 and residential end-use. The C_{ia} is adjusted to develop screening levels for soil gas or subslab vapors by assuming an attenuation factor of 0.03 in accordance with USEPA guidance². The attenuation factor represents the factor by which subsurface vapor concentrations migrating into indoor air spaces are reduced due to diffusive, advective, and/or other attenuating mechanisms. The following equation is used to calculate soil gas or subslab vapor screening levels based on target indoor air screening levels:

$$C_{sg} = \frac{C_{ia}}{\alpha_{sg}}$$

where: C_{sg} = screening concentration in soil gas or subslab vapor ($\mu\text{g}/\text{m}^3$)

C_{ia} = target indoor air concentration ($\mu\text{g}/\text{m}^3$)

α_{sg} = attenuation factor

¹ Regional Screening Level (RSL) Summary Table; USEPA May 2016

² OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. USEPA Office of Solid Waste and Emergency Response; June 2015.

If the measured sample concentrations are greater than the calculated screening levels (C_{sg}), then there is a potential for vapor intrusion.

The calculated C_{sg} values are summarized below in Table 2.

Table 2: Summary of Sub-Slab Soil Gas Screening Levels

Chemical Name	Target Levels C_{sg} ($\mu\text{g}/\text{m}^3$)
Benzene	120
Toluene	173,000
Ethylbenzene	367
Xylenes	3,330
MTBE	3,360
TPH - GRO	NA

NA – Not Applicable

3.0 REMEDIAL ALTERNATIVES CONSIDERED

Various types of remedial alternatives were considered for implementation for the subject Property, Ruhl Avenue, and the residential property. These remedial alternatives included one or a combination of air sparging/soil vapor extraction, bioremediation, and soil excavation and bioremediation.

3.1 Air Sparging/Soil Vapor Extraction

Soil vapor extraction (SVE) is a process whereby a vacuum is applied to the subsurface soils to induce air flow through the unsaturated soils beneath the site. Air sparging involves the injection of air beneath the water table to promote the volatilization and biodegradation of petroleum constituents that adhere to soil grains beneath the ground water. By inducing air flow through the subsurface soil, oxygen is provided to volatilize hydrocarbon constituents and provide oxygen and enhance the activity of the indigenous microorganisms that breakdown petroleum hydrocarbons.

This remedy was judged to be ineffective for the Property and residential property due to the clay rich site lithology, shallow ground water and the location of the contamination.

3.2 Trap and Treat Remediation

Trap and Treat Remediation utilizes the BOS products designed by Remediation Products, Inc. for the rapid immobilization and degradation of petroleum hydrocarbons. The BOS product consist of two proven technologies to effectively remediate petroleum hydrocarbon at impacted sites. The two technologies are 1) trapping of the contaminant via carbon adsorption within the injected fluid and

2) the subsequent treatment with biological degradation of the adsorbed contaminant. The injection utilizing BOS 200® would be applied to immobilize and treat the petroleum concentrations within the ground water associated with the USTs.

This remedy was judged to be ineffective for the Property due to the clay rich site lithology.

3.3 Soil Excavation and Bioremediation

- Two remedial techniques will be used to accomplish the remedial goals; excavation of petroleum impacted soils (i.e. isolated excavation on-site to reduce concentration contributing to off-site exceedance on the impacted residential property, and excavation off-site on the residential property to remove impacted soils contributing to the residential indoor air impacts), and enhanced aerobic bioremediation. A site overview of the proposed remedial action is provided in Figure 1. The bioremediation portion of the remedial action will entail adding compacted clean soil layered with an Oxygen Release Compound (ORC) within the excavation areas. Upon contact with ground water, the ORC slowly releases oxygen into the water which accelerates aerobic biodegradation by microorganisms already present in the soil. The ORC boosts the natural petroleum biodegradation rates by providing an ongoing oxygen source. Additionally, a chemical ORC will be placed with backfill lifts near the residence foundation and french drain system, where a quicker reaction may be needed due to potentially limited contact time associated with the water pathway through the residence drainage/sump system.

ORC will be introduced to the subsurface utilizing two methods:

- After the excavation depths (approximately 10 feet) have been reached at the designated excavation areas on and off property, the void areas will be filled with clean soil (fill) layers interspersed with layers of the ORC granular “powder like” material. This distribution technique will be utilized to address potential contamination migrating off-property, present beneath or surrounding the foundation of the residence, and beneath Ruhl Avenue. Each layer will be compacted in engineered lifts to reduce future settlement and provide support for future structures such as pavement.
- As a contingency measure, ORC/tap water liquid solution may be injected via the permeable reactive barrier (PRB) infrastructure installed during excavation activities and shown in Figure 1. The PRB will be installed parallel to Ruhl Avenue on the southern side of the roadway to intercept potential contamination present beneath Ruhl Avenue that was visually observed during installation of the water line shown in Figure 1. ORC injections will be based on the results collected from the existing monitoring well network and indoor air sampling results from the residential property after completion of the excavation activities.

In addition to the bioremediation re-injection contingency measure, additional excavation may be implemented as a contingency measure based on the results of the delineation sampling, visual observations during excavation, and/or excavation confirmation sample results. The contingencies provided within this RAP will be implemented only after BUSTR approval. The remedial contractor cost estimates are provided in Appendix I.

The excavation process should be completed in approximately two months in Summer/Fall 2016. The excavation and soil amendment activities will be evaluated by ground water and vapor sampling. Ground water monitoring events will be conducted for monitoring wells (MW-11, MW-14, MW-15, and the Proposed MW-16) 6-months and 1-year following completion of excavation, backfill, and soil amendment activities. Sub-slab vapor samples will be collected from the residence vapor mitigation system on a quarterly basis for a period of one year following completion of field construction activities. Sump water samples will also be collected quarterly in conjunction with vapor samples. Performance monitoring data results will be used to determine the potential termination of the environmental covenant (confirmed by sampling results) placed on the residential for the vapor mitigation system, as well as determine if contingent ORC injections are necessary. This remedy was chosen to achieve the remedial goals for the site, potentially amend or terminate the environmental covenant placed on the residential property, and achieve NFA status within the two year grant period.

4.0 DESCRIPTION OF REMEDIAL ACTIVITIES TO BE IMPLEMENTED

Based on the previous assessment activities, the following remedial activities will be completed:

- Site specific health & safety plan will be developed.
- Delineation sampling and baseline ground water, sub-slab vapor, and sump water sampling.
- Finalize excavation areal extent based on delineation sampling.
- Conduct quarterly sub-slab vapor monitoring beneath the residential structure after excavation activities are completed. Sump water samples will be collected quarterly along with the indoor air sampling.
- Excavate and remove approximately 100 tons of petroleum contaminated soil which is above residential SSTLs from the Subject Property.
- Excavate and remove approximately 750 tons of petroleum contaminated soil which is above residential SSTLs from the residential property.
- Replace the french drain piping and gravel located within the excavation on the residential property.
- The excavations will be backfilled with a mixture of clean soil, gravel, and granular ORC. Additionally, a chemical ORC will be placed with backfill lifts near the residence foundation and french drain system, where a quicker reaction may be needed due to potentially limited contact time associated with the water pathway through the residence drainage/sump system.

- Install a permeable reactive barrier (PRB) infrastructure in the right-of-way north of the residential property for potential future injections of ORC. An ORC/tap water liquid solution may be injected in the PRB based on sample results collected during performance monitoring sample events.
- Site will be restored after field activities have been completed.

4.1 Coordination for Remedial Activities

- TRC and remedial contractor will assist the Grantee with preparation of public notice, based on BUSTR letter to the Grantee to notify the public through public notice during the RAP approval process.
- TRC and remedial contractor will coordinate with the City of Bexley for any closure of Ruhl Avenue for excavation activities.
- TRC and remedial contractor will assist the Grantee in preparation of notification of underground injection to Ohio EPA (if required).
- Ground water encountered during the excavation will be collected and stored on-site in a frac tank and sampled to determine proper disposal procedures. It is anticipated that the ground water will be used to fill the pore space of the PRB following backfill and soil amendment activities.

5.0 PROGRESS REPORTS

Monitoring Plan and Reporting Frequency for the RAP

- Upon completion of the excavation activities a letter report will be generated detailing the remedial activities and confirmation samples results.
- Baseline sampling of ground water will be conducted prior to excavation and soil amendment activities. Post-treatment ground water sampling will be conducted 6-months and 1-year following completion of excavation backfill and soil amendment tasks. Monitoring will include collection of field parameters from 4 selected monitoring wells and ground water level measurements from network monitoring wells. Field sampling parameters will include oxidation-reduction potential, electrical conductivity, dissolved oxygen, and pH. Based on the results of the ground water sampling events a bioremediation re-injection event may be implemented.
- A baseline sub-slab vapor sample will be collected from the residential vapor mitigation system prior to excavation and soil amendment activities. Following field construction activities, sub-slab vapor samples will be collected on a quarterly basis for a period of one year.
- At the completion of the last confirmatory sampling event, TRC will prepare a remedial action completion report that documents all activities and results associated with the RAP. The remedial completion report will be submitted to BUSTR for consideration of a no-further-action status for the subject Property.

6.0 REMEDIAL ACTION PLAN SCHEDULE

A conceptual time-line showing the projected schedule for the remedial system is provided in Figure 2. A detail cost estimate to complete the project is provided in Table 3.

Upon written approval of this RAP from BUSTR, TRC can initiate the implementation of the RAP upon Client authorization and Grant funding approval and agreement. Implementation will include the activities referenced above. It is anticipated the excavation and site restoration activities will be completed in approximately nine weeks. After PRB has been installed, TRC will implement the monitoring and sampling plan referenced above.

TRC will perform post-monitoring of the system (if required by BUSTR), review the data collected and develop recommendations based on those findings that will be submitted to BUSTR for consideration and request for a no further action status for the Property. Once a no further action status has been issued, decommissioning of the PRB and abandonment of the entire monitoring well network will be completed.

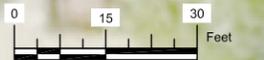
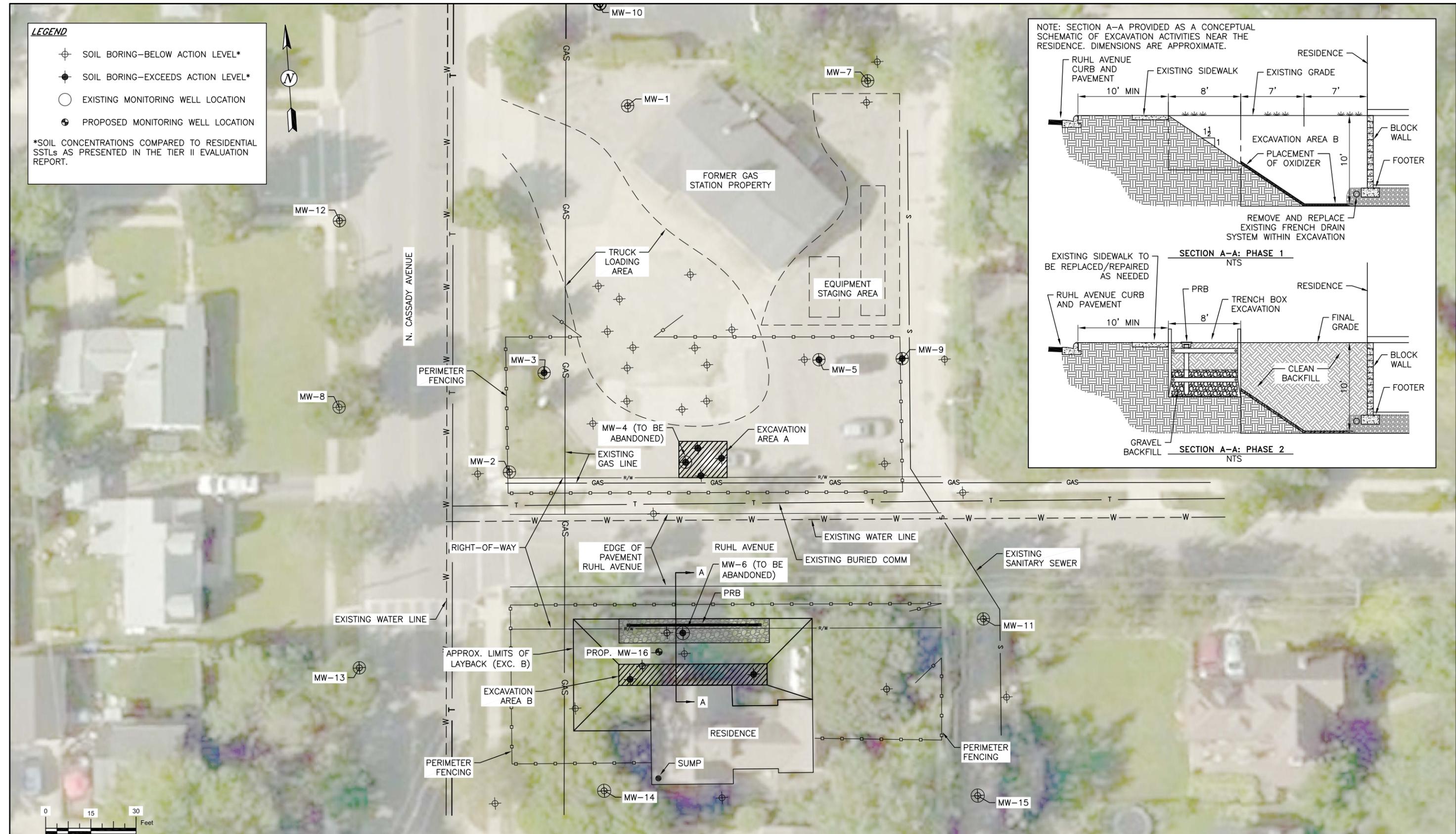
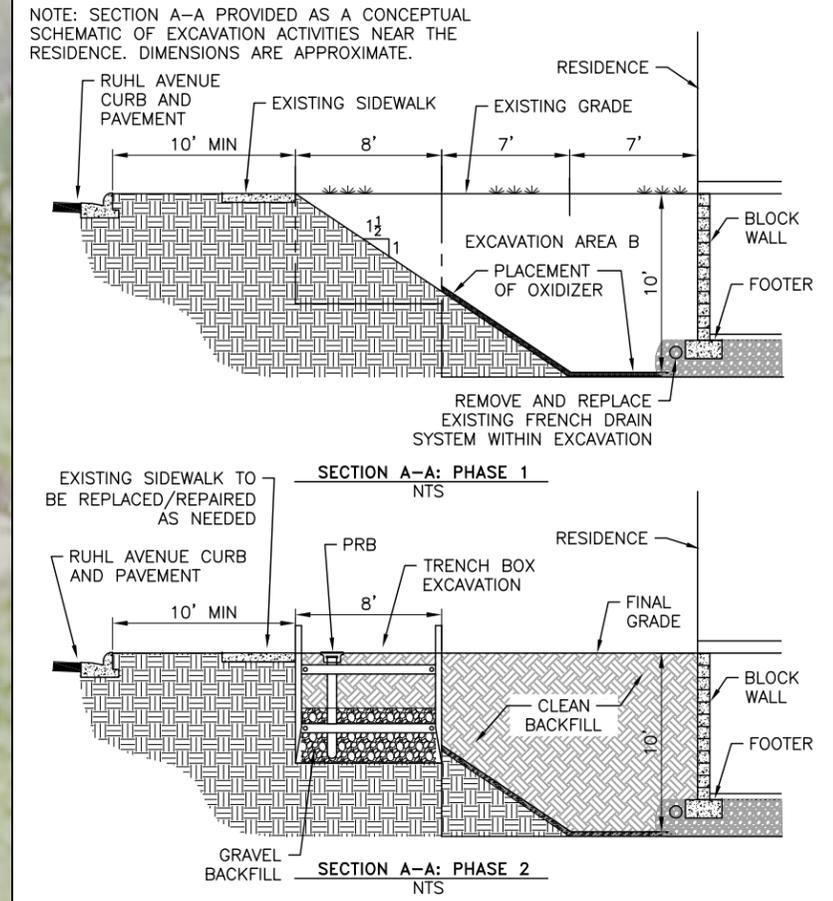
This RAP is projected to take approximately 12 to 20 months to complete.

FIGURES

LEGEND

- ⊕ SOIL BORING-BELOW ACTION LEVEL*
- ⊕ SOIL BORING-EXCEEDS ACTION LEVEL*
- EXISTING MONITORING WELL LOCATION
- ⊕ PROPOSED MONITORING WELL LOCATION

*SOIL CONCENTRATIONS COMPARED TO RESIDENTIAL SSTLS AS PRESENTED IN THE TIER II EVALUATION REPORT.



1" = 15'
(SCALE FOR DRAWING FORM 22" X 34")

NOTES:
 1. LOCATIONS OF EXISTING INFRASTRUCTURE AND SOIL BORINGS ARE APPROXIMATE.
 2. SOIL ANALYTICAL DATA AND BORING DETAILS ARE PROVIDED IN THE TIER 2 EVALUATION REPORT, CASSADY SUNOCO, 396 NORTH CASSADY AVENUE, BEXLEY, OHIO 43209, BUSTR RELEASE NO. 25002648-N00001, DATED JULY 16, 2015.

REV	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	PROJ ENGR	LEAD ENGR
2	6/9/16	FINAL RAP	ERV	JAW	NS	ERV
1	5/13/16	DRAFT-FINAL RAP	ERV	TJH	NS	ERV
0	4/11/16	DRAFT RAP	NS	ERV	NS	ERV

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CASSADY SUNOCO REMEDIATION
BEXLEY, OHIO
BUSTR RELEASE NO 25002648-N00001

**PROPOSED REMEDIAL ACTION
SITE LAYOUT**

PROJECT NO.:
CADD DWG FILE:
01-SITE OVERVIEW_PHASED APPROACH
DESIGNED BY:
DRAWN BY:
CHECKED BY:

DATE:
DATE:
DATE:

FIGURE 1